

S/N: 10/510,583
 Reply to Office Action of May 15, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1 - 23. Cancelled.

24. (Previously Presented) A process for preparing halogen-containing silanes of the general formula (I):



where

R is a substituted or unsubstituted C₁₋₁₀ alkyl or C₆₋₁₀ aryl radical of which one or more carbon atoms are optionally replaced by -CO-, -CO₂-, -O-, -S-, -SO-, -SO₂-, -NH- or -NR'-, where R' is a substituted or unsubstituted alkyl radical having from 1 to 20 carbon atoms,

X is fluorine, chlorine or bromine,

a is an integer of 0, 1, 2 or 3,

b is an integer of 0, 1, 2 or 3 and

c is an integer of 1, 2, 3 or 4,

with the proviso that the sum of a + b + c = 4,

comprising reacting silicon, under the action of microwave energy, with elements or compounds selected from the group consisting of halogens; halogens and organohalogen compounds; halogens and hydrogen; halogens and hydrogen halides; organohalogen compounds; organohalogen compounds and hydrogen; organohalogen compounds and hydrogen halide; hydrogen halides; fluorosilanes and hydrogen; fluorosilanes and hydrogen halide; hydrogen-containing chlorosilanes and hydrogen; hydrogen-containing

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chlorosilanes and hydrogen halides; organohalosilanes and hydrogen; organohalosilanes and hydrogen halides; and hydrocarbons and hydrogen halides.

25. (Previously Presented) The process of claim 24, wherein silicon is contacted with halogen, a halogen compound, or mixture thereof in gaseous form and exposed to microwave energy.

26. (Previously Presented) The process of claim 24, wherein crystalline silicon is used.

27. (Previously Presented) The process of claim 24, wherein coarsely crystalline silicon is used.

28. (Previously Presented) The process of claim 24, wherein amorphous silicon is used.

29. (Previously Presented) The process of claim 28, wherein amorphous silicon is used in admixture with crystalline silicon.

30. (Previously Presented) The process of claim 24, further comprising employing a catalyst or promoter.

31. (Previously Presented) The process of claim 24, further comprising employing a substance which absorbs microwave energy and transfers thermal energy to silicon.

32. (Previously Presented) The process of claim 24, wherein said compound comprises a hydrogen halide.

33. (Previously Presented) The process of claim 24, further comprising employing a metal or metal compound as a catalyst or promoter.

34. (Previously Presented) The process of claim 33, wherein said promoter comprises Cu.

35. (Previously Presented) The process of claim 24, wherein nonpulsed microwave energy is used.

36. (Previously Presented) The process of claim 24, wherein said silicon has a mean particle size of $> 70 \mu\text{m}$.

37. (Previously Presented) The process of claim 24, wherein said organohalogen compound comprises an alkyl halide or aryl halide.

38. (Previously Presented) The process of claim 24, wherein said organohalogen compound comprises methyl chloride.

39. (Previously Presented) The process of claim 24, wherein silicon is employed in the form of a silicon alloy.

40. (Previously Presented) The process of claim 39, wherein said silicon alloy is ferrosilicon.

41. (Previously Presented) The process of claim 24, wherein said halogen-containing silane comprises compounds of the formula $\text{F}_n\text{SiH}_{4-n}$ where $n = 1-3$, prepared by contacting elemental silicon and fluorosilanes under microwave excitation with hydrogen, hydrogen fluoride, or hydrogen and hydrogen fluoride.

42. (Previously Presented) The process of claim 41, wherein elemental silicon and SiF_4 gas are contacted under microwave excitation with hydrogen, hydrogen fluoride, or hydrogen and hydrogen fluoride.

43. (Previously Presented) The process of claim 24, wherein said halogen-containing silane comprises compounds of the formula $\text{Cl}_n\text{SiH}_{4-n}$ where $n = 1-3$, prepared by contacting elemental silicon and one or more hydrogen-containing chlorosilanes under microwave excitation with hydrogen, hydrogen chloride, or hydrogen and hydrogen chloride.

44. (Previously Presented) The process of claim 41, wherein a mixture of different compounds $\text{F}_n\text{SiH}_{4-n}$ is prepared.

45. (Previously Presented) The process of claim 43, wherein a mixture of different compounds of $\text{Cl}_n\text{SiH}_{4-n}$ is prepared.

46. (Previously Presented) The process of claim 44, wherein the mixture is separated by low-temperature condensation or by liquid distillation.

47. (Previously Presented) The process of claim 45, wherein the mixture is separated by low-temperature condensation or by liquid distillation.

48. (Previously Presented) The process of claim 41, wherein the hydrogen content of the products is regulated by varying the concentration of hydrogen and/or hydrogen halide.

49. (Previously Presented) The process of claim 43, wherein the hydrogen content of the products is regulated by varying the concentration of hydrogen and/or hydrogen halide.

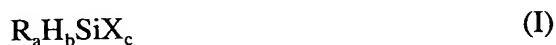
50. (Previously Presented) The process of claim 24, wherein compounds of the formula $X_n\text{SiH}_{4-n}$ are obtained, where X is F or Cl and n is 1-3, further comprising pyrolytically decomposing the $X_n\text{SiH}_{4-n}$ compounds to obtain highly pure silicon.

51. (Previously Presented) The process of claim 50, wherein gases formed during pyrolytic decomposition are recycled or used directly to synthesize SiX_4 where X is fluorine or chlorine.

52. (Previously Presented) The process of claim 24, wherein elemental silicon and one or more organohalogen compounds are contacted under microwave excitation with hydrogen, hydrogen halide, or hydrogen and hydrogen halide.

53. (Previously Presented) The process of claim 24, wherein the hydrocarbon is methane or ethane.

54. (New) A process for preparing halogen-containing silanes of the general formula (I):



where

R is a substituted or unsubstituted C_{1-10} alkyl or C_{6-10} aryl radical of which one or more carbon atoms are optionally replaced by -CO-, -CO₂-, -O-, -S-, -SO-, -SO₂-, -NH- or -NR'-, where R' is a substituted or unsubstituted alkyl radical having from 1 to 20 carbon atoms,

X is fluorine, chlorine or bromine,

a is an integer of 0, 1, 2 or 3,

b is an integer of 0, 1, 2 or 3 and

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comprising reacting silicon, under the action of microwave energy, with elements or compounds selected from the group consisting of halogens; halogens and organohalogen compounds; halogens and hydrogen; halogens and hydrogen halides; organohalogen compounds and hydrogen; organohalogen compounds and hydrogen halide; hydrogen halides; fluorosilanes and hydrogen; fluorosilanes and hydrogen halide; hydrogen-containing chlorosilanes and hydrogen; hydrogen-containing chlorosilanes and hydrogen halides; organohalosilanes and hydrogen; organohalosilanes and hydrogen halides; and hydrocarbons and hydrogen halides.

55. (New) The process of claim 24, wherein the silicon is free of catalysts.